

NOTIFICATION OF AUTOMATICALLY FORWARDED ELECTRONIC MAIL
MESSAGES IN A DATA PROCESSING SYSTEM

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particularly agencies which must interact with virtually all segments of society such as the Internal Revenue Service and secretaries of state. Providing informational guides and/or searchable databases of online public records may reduce operating costs. Further, the Internet is becoming increasingly popular as a medium for commercial transactions.

The Internet also provides a medium for sending electronic mail messages between different users or recipients. These electronic mail messages are also referred to as email. With email, a user may send a message to one or more recipients almost instantaneously. Some users may have more than one email address. Additionally, email addresses are constantly changing for different reasons. Sometimes, a user may change service providers and receive a new email address. Other times, a service provider may be bought by or merged with another service provider. Sometimes when a service provider is bought or merged with another service provider, the combined entity will force or require some users to change domain names to have a consistent domain name in the email addresses.

When such a situation occurs, a user changing email addresses is required to notify everyone of the email address change. In many cases, when a change in domain name is required by a service provider, a grace period may be present in which both email addresses are accepted. When a user changes service providers, the user typically will maintain the old email address for a period of time and have the email sent to the old address forwarded to the new address.

It is important for a user to recognize that email is

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being forwarded from the original address to the new address in order to notify the sender of the email of the address change. Currently, this forwarding must be detected by looking at the "to:" field in the message to determine whether the address is the old address. In some cases, the message may be sent to many recipients in which all of these recipients are listed in the "to:" field. Such a procedure can become tedious when many recipients are listed for the email. Further, even if the user is meticulous in checking every email received to see whether it was forwarded from an old address, the address may not appear at all. For example, some email may be sent via distribution lists using a remailer program. In this case, the sender sends a note addressed to the distribution list on the server and the program distributes the email to all addresses currently found on the list. The "to:" field in the note may show for example, "distlistmail@abcd.org" rather than all of the addresses in the list. The actual address in this case is located in the routing information, but this information is typically removed by many email programs.

Therefore, it would be advantageous to have an improved method and apparatus for processing forwarded email messages to allow a user to identify messages forwarded from an old email address.

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BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a pictorial representation of a distributed data processing system in which the present invention may be implemented;

Figure 2 is a block diagram of a data processing
15 system that may be implemented as a server in accordance
with a preferred embodiment of the present invention;

Figure 3 is a block diagram illustrating a data processing system in which the present invention may be implemented;

20 **Figure 4** is a diagram illustrating an indicator for
use in an email message in accordance with a preferred
embodiment of the present invention;

Figure 5 is a diagram illustrating components and data flow used in indicating forwarding of email messages in accordance with a preferred embodiment of the present invention; and

Figure 6 is a flowchart of a process used for providing indicators for forwarded email messages in accordance with a preferred embodiment of the present invention.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, **Figure 1** depicts a
5 pictorial representation of a data processing system
network in which the present invention may be implemented.
Data processing system network **100** is a network of
computers in which the present invention may be
implemented. Data processing system network **100** contains
10 a network **102**, which is the medium used to provide
communications links between various devices and computers
connected together within data processing system network
100. Network **102** may include permanent connections, such
as wire or fiber optic cables, or temporary connections
15 made through telephone connections.

In the depicted example, a server **104** is connected to
network **102** along with proxy server **106**. In addition,
clients **108**, **110**, and **112** also are connected to network
102. These clients **108**, **110**, and **112** may be, for example,
20 personal computers or network computers. In the depicted
example, server **104** provides data, such as boot files,
operating system images, and applications to clients
108-112. Server **104** also may serve to receive and
distribute email messages to different clients. In the
25 depicted examples, proxy server **106** also may serve to
distribute email messages to different clients. In this
example, proxy server **106** may receive messages from server
104 for distribution to different clients.

Clients **108**, **110**, and **112** are clients to server **104**.
30 Distributed data processing system **100** may include
additional servers, clients, and other devices not shown.

In the depicted example, data processing system network 100 is the Internet with network 102 representing a worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another.

15 Referring to **Figure 2**, a block diagram of a data processing system that may be implemented as a server, such as server 104 or proxy server 106 in **Figure 1**, is depicted in accordance with a preferred embodiment of the present invention. In particular, server 200 contains the
20 processes used to notify users or recipients of email messages that an email has been forwarded. The notification mechanism of the present invention includes an indicator or indication in the email message that the email message has been forwarded from another address
25 associated with the user or recipient.

Server 200 may be a symmetric multiprocessor (SMP) system including a plurality of processors 202 and 204 connected to system bus 206. Alternatively, a single processor system may be employed. Also connected to system bus 206 is memory controller/cache 208, which provides an interface to local memory 209. I/O bus bridge

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210 is connected to system bus 206 and provides an interface to I/O bus 212. Memory controller/cache 208 and I/O bus bridge 210 may be integrated as depicted.

Peripheral component interconnect (PCI) bus bridge
5 214 connected to I/O bus 212 provides an interface to PCI local bus 216. A number of modems may be connected to PCI bus 216. Typical PCI bus implementations will support four PCI expansion slots or add-in connectors. Communications links to network computers 108-112 in
10 **Figure 1** may be provided through modem 218 and network adapter 220 connected to PCI local bus 216 through add-in boards.

Additional PCI bus bridges 222 and 224 provide interfaces for additional PCI buses 226 and 228, from
15 which additional modems or network adapters may be supported. In this manner, data processing system 200 allows connections to multiple network computers. A memory-mapped graphics adapter 230 and hard disk 232 may also be connected to I/O bus 212 as depicted, either
20 directly or indirectly.

Those of ordinary skill in the art will appreciate that the hardware depicted in **Figure 2** may vary. For example, other peripheral devices, such as optical disk drives and the like, also may be used in addition to or in
25 place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

The data processing system depicted in **Figure 2** may be, for example, an IBM RISC/System 6000 system, a product
30 of International Business Machines Corporation in Armonk, New York, running the Advanced Interactive Executive (AIX)

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operating system.

With reference now to **Figure 3**, a block diagram illustrating a data processing system in which the present invention may be implemented is depicted. Data processing system **300** is an example of a client computer. Data processing system **300** employs a peripheral component interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus architectures such as Accelerated Graphics Port (AGP) and Industry Standard Architecture (ISA) may be used. Processor **302** and main memory **304** are connected to PCI local bus **306** through PCI bridge **308**. PCI bridge **308** also may include an integrated memory controller and cache memory for processor **302**. Additional connections to PCI local bus **306** may be made through direct component interconnection or through add-in boards. In the depicted example, local area network (LAN) adapter **310**, SCSI host bus adapter **312**, and expansion bus interface **314** are connected to PCI local bus **306** by direct component connection. In contrast, audio adapter **316**, graphics adapter **318**, and audio/video adapter **319** are connected to PCI local bus **306** by add-in boards inserted into expansion slots. Expansion bus interface **314** provides a connection for a keyboard and mouse adapter **320**, modem **322**, and additional memory **324**. Small computer system interface (SCSI) host bus adapter **312** provides a connection for hard disk drive **326**, tape drive **328**, and CD-ROM drive **330**. Typical PCI local bus implementations will support three or four PCI expansion slots or add-in connectors.

An operating system runs on processor **302** and is used to coordinate and provide control of various components

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within data processing system 300 in **Figure 3**. The operating system may be a commercially available operating system, such as Windows 2000, which is available from Microsoft Corporation. An object oriented programming system such as Java may run in conjunction with the operating system and provides calls to the operating system from Java programs or applications executing on data processing system 300. "Java" is a trademark of Sun Microsystems, Inc. Instructions for the operating system, the object-oriented operating system, and applications or programs are located on storage devices, such as hard disk drive 326, and may be loaded into main memory 304 for execution by processor 302.

Those of ordinary skill in the art will appreciate that the hardware in **Figure 3** may vary depending on the implementation. Other internal hardware or peripheral devices, such as flash ROM (or equivalent nonvolatile memory) or optical disk drives and the like, may be used in addition to or in place of the hardware depicted in **Figure 3**. Also, the processes of the present invention may be applied to a multiprocessor data processing system.

For example, data processing system 300, if optionally configured as a network computer, may not include SCSI host bus adapter 312, hard disk drive 326, tape drive 328, and CD-ROM 330, as noted by dotted line 332 in **Figure 3** denoting optional inclusion. In that case, the computer, to be properly called a client computer, must include some type of network communication interface, such as LAN adapter 310, modem 322, or the like. As another example, data processing system 300 may

be a stand-alone system configured to be bootable without relying on some type of network communication interface, whether or not data processing system 300 comprises some type of network communication interface. As a further example, data processing system 300 may be a Personal Digital Assistant (PDA) device, which is configured with ROM and/or flash ROM in order to provide non-volatile memory for storing operating system files and/or user-generated data.

10 The depicted example in **Figure 3** and above-described
examples are not meant to imply architectural
limitations. For example, data processing system **300**
also may be a notebook computer or hand held computer in
addition to taking the form of a PDA. Data processing
15 system **300** also may be a kiosk or a Web appliance.

The present invention provides a method, apparatus, and program for indicating that an email message has been forwarded from an email address associated with a recipient. This associated address is typically an old email address that the recipient intends to no longer use after a period of time. The mechanism of the present invention identifies these type of email addresses and adds or includes an indicator with the email message. In the depicted example, the indicator takes the form of a block of text added to the body of the email message.

Turning next to **Figure 4**, a diagram illustrating an indicator for use in an email message is depicted in accordance with a preferred embodiment of the present invention. In this example, indicator **400** is a visual
30 indicator that is placed within an email message. Specifically, indicator **400** is placed in the body portion

of the message. The body portion of an email message is that portion of the email message in which the actual content of the message is placed.

In this example, indicator 400 takes the form of text, identifying the message as being an email message forwarded from a particular address and reminding the recipient to notify the sender of the new address. Further, this text may be placed using different colors than the text of the rest of the message in the email message. Depending on the particular implementation, the indicator may take different forms other than that as illustrated by indicator 400. For example, a graphical indicator may be used instead of text. The indicator may be another window, such as a browser, which is automatically launched when the email is viewed. Audio indicators may be used in place of or in addition to the visual indicators. An audio indicator may be, for example, a ".wav" file that is played or presented when the email message is viewed.

Turning next to **Figure 5**, a diagram illustrating components and data flow used in indicating forwarding of email messages is depicted in accordance with a preferred embodiment of the present invention. In this example, proxy server **500** receives email messages from an email server **502**. These email messages are forwarded to different recipients, such as recipient **504**. Of course, these processes also may be implemented in an email server, such as email server **502**, rather than proxy server **500** used to forward email messages.

30 Email messages are received and placed into incoming
email 506 to await processing. Incoming email 506 may

be, for example, a buffer or queue used for holding email messages until they are processed. Email process 508 examines each email message within incoming email 506 to see whether the email is to be forwarded to another address for the recipient. If the email message is to be forwarded to another email address other than the original email address in the email message, a notification will be placed into the email message or associated with the email message from notification database 510. This notification may take the form of indicator 400 in **Figure 4**. The notification may include, for example, the old email address that the sender used as well as an indication to notify the sender of the new email address. Of course, the indicator selected from notification database 510 may take other forms, such as using graphics or audio presentation.

Further, email process 508 also may place an advertisement into the email message from advertisement database 512. Also, a user may be billed for the notification service. In such a case, billing database 514 is updated by email process 508 each time a particular user receives a notification of a forwarded email message. Billing database 514 may include an identification of the recipient who is to receive notifications of forwarded email messages and tracking information to identify the number of times that notifications have been placed in an email message.

When the email message has been processed, the message is placed into outgoing email 516 for delivery to a recipient, such as recipient 504. Like incoming email 506, outgoing email 516 may be a buffer or queue for

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processed email messages in these examples.

Proxy server **500** provides a mechanism for forwarding email messages with indicators. Proxy server **500** further provides a mechanism in which advertisements or billing
5 may occur for email messages being forwarded to a particular recipient. Additionally, existing mail servers are not required to make changes to support this forwarding mechanism in which indicators are added or associated with an email message.

10 Turning next to **Figure 6**, a flowchart of a process used for providing indicators for forwarded email messages is depicted in accordance with a preferred embodiment of the present invention. In these examples, the process illustrated in **Figure 6** may be implemented
15 within an email server such as server **104** or proxy server **106** in **Figure 1**.

The process begins by receiving an email message (step **600**). A recipient is then identified for the email message (step **602**). Next, a determination is made as to
20 whether the email message is a forwarded email message for another address for the recipient (step **604**). If the message is to be forwarded, then a determination is made as to whether the recipient is to receive an indicator notifying the recipient that the email message is a
25 forwarded email message (step **606**).

If the recipient is to receive a notification, an indicator of the forwarding of the message is added to the body of the email message (step **608**). In these examples, the indicator is added to the body of the email
30 message, using an indicator, such as indicator **400** in **Figure 4**. Of course, other types of indicators, such as

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those described above, may be added to the body of the text or associated with the email message depending on the implementation.

Next, a determination is made as to whether an advertisement is to be added to the email message (step 610). Depending on the implementation, an advertisement may be placed in the message as a mechanism to generate revenues for the function from entities wanting to distribute advertisements. If an advertisement is to be added, the advertisement is added to the email message (step 612). Then, a determination is made as to whether the recipient or some other entity is to be billed for the addition of the indicator to the email message (step 614). It is also possible that the billing is simply a subscription service, not a per-mail-item charge. The process proceeds directly to this step from step 610 if an advertisement is not to be added to the message. The billing function provides another mechanism to generate revenues for providing the indicator service for forwarded email messages. If billing is to occur, a billing database for the recipient or other entity is then updated to reflect the processing of the email message (step 616). Thereafter, the email message is sent to the recipient (step 618) with the process terminating thereafter.

With reference again to step **614**, if billing is not to occur, the process proceeds directly to step **618** as described above. Referring back to step **606**, if the recipient is not to be notified, then the process
30 proceeds to step **618**. Turning back to step **604**, if the email message is not one that is being forwarded from

another email address associated with the recipient, then the process proceeds directly to step 618.

The process described in **Figure 6** will add the notification information to the message and remail the message to the forwarding address if the process is implemented as part of an email server. Alternatively, if implemented in a proxy server, the email server is configured to forward all incoming mail to the address for the proxy server. The proxy server will add the notification prior to forwarding the message to the recipient. Thus, when implemented with a proxy server, two "hops" are required to send the message to the recipient.

The mechanism of the present invention is particularly useful when an email address for a recipient is to change. For example, a user has an email address JerryMalcolm@ibm.net that is going away as a result of a merger or change in ownership. The host has an email mailbox server that hosts a mailbox called JerryMalcolm. The owner of that mailbox is able to have the mail server hold mail for collection by the user's mail program, such as that provided in Netscape Navigator. Alternatively, the user may have messages forwarded to a new email address, such as Jerry@Malcolms.com. If the host mailbox server has implemented the mechanism of the present invention, the user may have the email server append the forwarding notification information to the body of the note as it does the forwarding. If the host email server does not implement the mechanism of the present invention, but "abc123.com" has a server that does and is in the business of providing notifications, the user may contract with abc123.com to provide the user a mailbox on

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their server for a period of time. The user would have the host email server forward the user's messages to JerryMalcolm@abc123.com. Subsequently, the user would have the server for abc123.com forward incoming messages
5 to Jerry@Malcolms.com and also append the forwarding notification. In turn, abc123.com may either charge the user for the service, such as in the form of a subscription or a per-item charge. Alternatively, abc123.com may obtain revenues for the service by selling
10 advertisement space in the notifications and append advertisements along with the notifications.

Thus, the present invention provides an improved method, apparatus, and program for a forwarding service or mechanism for forwarding information to an email
15 message. An indicator is added to an email message that is forwarded from another email address associated with the recipient. This indicator is used to provide notification to the recipient that the email message was sent to another email address and forwarded to the
20 recipient. The indicator is also used to allow the recipient to notify the sender of the new email address. In the depicted examples, this function is implemented in a proxy server, which receives email messages from email servers. This proxy server identifies whether an email
25 message is being forwarded to another email address for the user and adds the appropriate indicator. Additionally, the addition of advertisements and/or billing may be performed in the proxy server. The use of the proxy server allows the addition of this forwarding
30 service or function without requiring changes to the existing email servers.

It is important to note that while the present

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invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the distribution. Examples of computer readable media include recordable-type media, such as a floppy disk, a hard disk drive, a RAM, CD-ROMs, DVD-ROMs, and transmission-type media, such as digital and analog communications links, wired or wireless communications links using transmission forms, such as, for example, radio frequency and light wave transmissions. The computer readable media may take the form of coded formats that are decoded for actual use in a particular data processing system.

The description of the present invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. Although the depicted examples illustrated placing the indicator in the body of the electronic message, the indicator may be placed anywhere within the electronic message, such as in the subject field. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to

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the particular use contemplated.

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